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Burman, J.

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BRIEF REPORT

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Food-specific immunoglobulin (IgE) concentrations can be used to predict clinical allergies (1), but there has been less research on how to predict the severity of an allergic reaction (2). Studies of milk allergies have shown a correlation between the IgE levels in reaction to cows' milk protein and the severity of the allergic reaction as a result of food challenges (3). Previously, no correlation has been proposed between arachis hypogaea allergen 2 (Ara h 2) levels and the severity of peanut allergies (4).

This study primarily evaluated the predictive power of Ara h 2 IgE in relation to the threshold dose in a peanut challenge.

A total of 36 children with a high suspicion of peanut allergies underwent open food challenges with peanuts. All participants were sensitised to peanuts (Ara h 2 IgE > 0.35 kU/L) and the mean Ara h 2 level was 35.7 kU/L (range 0.40–260 kU/L). The challenge was performed according to the practical allergy recommendations from the European Academy of Allergy and Clinical Immunology and the American Academy of Allergy, Asthma and Immunology (5). This involved using peanut protein doses of 5, 25, 50, 200 and 1000 mg, with a cumulative protein dose of 1280 mg. The reaction was assessed using dose-adjusted severity scoring in the 21 (58%) of patients with a positive oral food challenge. We analysed serum Ara h 2 IgE levels and their association with the cumulative protein dose, also known as the threshold dose, the severity of the response and the use of adrenaline during the challenge. Patients were divided into two groups according to whether their Ara h 2 IgE levels were less than or at least 10 kU/L (Table 1). SPSS Statistics version 22.0 (IBM Corp, Armonk, New York, USA) was used in the analysis of the results. The Ethics Committee of Helsinki University Hospital, Finland, approved the study.

The groups were identical in terms of the age and sex of the participants (Table 1). The Spearman test (r) showed that Ara h 2 IgE correlated with the cumulative protein dose or threshold dose ($r = -0.439$, $p = 0.023$) but not with reaction severity ($r = 0.091$, $p = 0.348$) or with the use of adrenaline ($r = 0.300$, $p = 0.093$). Children with an Ara h 2 IgE of <10 kU/L had higher threshold doses than children with a higher level (median 480 mg versus 42.5 mg and mean 644 versus 71 mg, $p = 0.016$). There were no significant differences in the severity of the reactions or the use of adrenaline between the two groups (Table 1).

We conclude that the Ara h 2 IgE level predicted the peanut exposure threshold dose. A low threshold dose increased the risk of an allergic reaction as a result of accidental exposure, which may lead to a severe real-world reaction.

Table 1 Patient characteristics according to Ara h 2 IgE

Group	Ara h2 IgE <10 kU/L (n = 13)	Ara h2 IgE ≥10 kU/L (n = 8)	Significance
Age (years), Mean, Range	7.6, 3.39–14.32	8.3, 5.58–11.51	0.611 x
Sex (male)	7 (54%)	5(63%)	0.528 xx
Reaction intensity			
Mild	5 (39%)	1 (13%)	0.346 xx
Intermediate/severe	8 (62%)	7 (88%)	0.346 xx
Use of adrenaline	3 (23%)	4 (50%)	0.215 xx
Cumulative peanut dose in challenge (mg) median, range	480 (30–1280)	42.5 (30–230)	0.016 xxx

x, Independent sample *T*-test; xx, Fischer exact test; xxx, Mann-Whitney *U* Test.

FINANCE

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CONFLICT OF INTEREST

The authors have no conflict of interest to declare.

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J Burman (janne.burman@fimnet.fi),
A K Kukkonen, A S Pelkonen, M J Mäkelä
Helsinki University Skin and Allergy Hospital, Helsinki, Finland

Correspondence
Janne Burman, Iho ja Allergiasairaalan lastenyksikkö, Meilahdentie 2 00250 Helsinki, Finland
Tel: +358406517912 |
Fax: +358946186416 |
Email: janne.burman@fimnet.fi

